Robonaut 2 (R2)

Completed Technology Project (2014 - 2016)

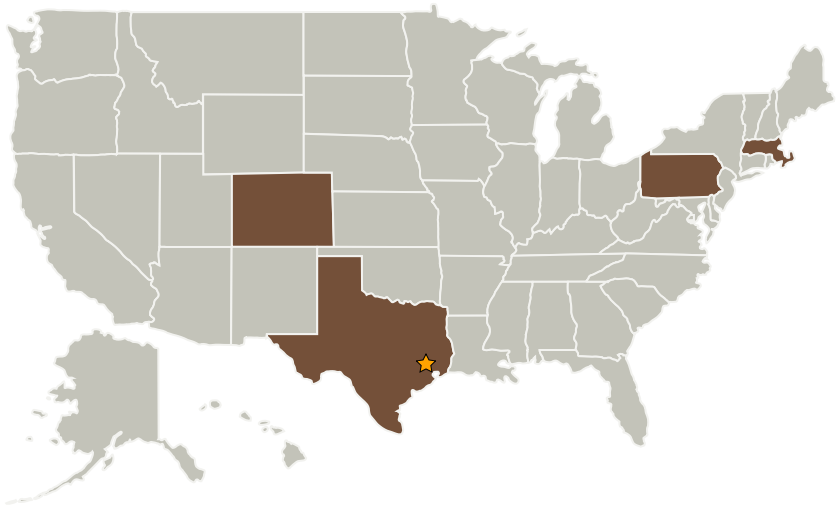
Project Introduction

R2 is the humanoid robot currently on ISS. R2 is designed to off-load routine and repetitive work from the crew. The crew can then spend more time on science and research.

Anticipated Benefits

Benefits to NASA Funded Missions: Robonaut's ability to autonomously climb within the ISS will allow R2 to translate to various locations within ISS to perform useful work for the crew thereby off-loading the crew from those activities. This work will also serve as a on-orbit testbed for future exploration activities, infusing new capabilities from academia and industry. Robonaut hand technology is currently being integrated into a space suit glove as part of the GCD next generation life support project. Benefits to NASA Unfunded & Planned Missions: Robonaut on ISS serves as a testbed for future exploration activities. Using the microgravity environment to highlight and showcase unique humanoid capabilities, including. Benefits to Other Government Agencies: Robonaut has multiple spinoff technologies that have applications and potential applications for other US government agencies. The Roboglove is a spinoff that has been explored for use as a rehabilitation device with the Veteran's administration. The x1 exoskeleton is a Robonaut spinoff that has state-side rehabilitation applications. Benefits to the Commercial Space Industry: This item does not benefit the commercial space industry. Benefits to the Nation: This item does not benefit the nation

Primary U.S. Work Locations and Key Partners



Robonaut 2

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Game Changing Development

Game Changing Development

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Colorado	Massachusetts
Pennsylvania	Texas

Project Transitions

October 2014: Project Start

September 2016: Closed out

Closeout Summary: The R2 ISS Exploration Testbed Project focused on preparing the on orbit R2 to become a robotic testbed on the ISS for furthering space robotics technologies needed for future exploration endeavors. The main goals of this project included preparing the hardware on orbit for use by completing the checkout procedures through autonomous stow/unstow activities, and integrating autonomous capabilities into climbing, tool use, and manipulation using ground testing. During FY16, this element demonstrated the utility of an autonomous robotic caretaker during planned deep-space habitat dormancy stages. In particular, Robonaut 2 demonstrated unloading cargo bags from a mock-up resupply vehicle in a gravity offload environment. This demonstration furthered autonomous commanding technology, by developing object recognition and manipulation capabilities that will remove the need for existing user-interface technologies with work continuing under AES.

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

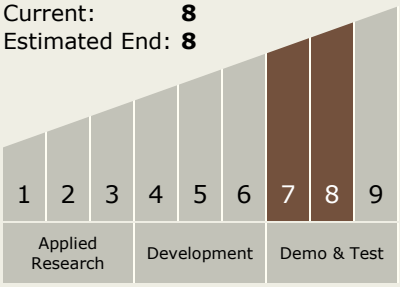
Program Director:
Mary J Werkheiser

Program Manager:
Gary F Meyering

Principal Investigator:
William J Bluethmann

Technology Maturity (TRL)

Start: **7**
Current: **8**
Estimated End: **8**



Target Destination

Earth